REMARKS/ARGUMENTS

A PETITION FOR EXTENSION OF TIME has been filed, concurrently with this Amendment, extending the time for response to the Official Action two (2) months, from November 15, 2007, to January 15, 2008. The Commissioner is authorized to deduct the extension fees, namely, $460.00, from Deposit Account No. 04-1679.

As a result of this Amendment, claims 1-15, 20-21, and 23-24 are under active consideration in the subject patent application, claims 16-19 stand withdrawn until a generic claim is allowed, and claims 22 and 25 are canceled.

In the Official Action, the Examiner has:

(1) acknowledged Applicant's election of Species without traverse;

(2) objected to the disclosure for various informalities;

(3) rejected claim 24 under 35 U.S.C. §101 by alleging that the claimed method lacks steps to perform the method;

(4) rejected claims 1, 3, 6-16, 23, and 24 under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No 2,020,563, issued to Moore (the "Moore reference")

(5) rejected claims 20 and 21 under 35 U.S.C. §103(a) in view of the Moore reference;

(6) rejected claims 2, 4, and 5 under 35 U.S.C. §103(a) in view of a proposed combination of the Moore reference, and U.S. Patent No. 5,573,029, issued to Freimann (the "Freimann reference"); and

(7) identified prior art made of record and not relied upon but considered pertinent to Applicant's disclosure.

With regard to Items 1-3, in view of Applicant's election of species claims 16-19 stand withdrawn until a generic claim is allowed by the Examiner. The various informalities identified by the Examiner have been corrected, and withdrawal of these objections is requested. Claim 24 has been amended so as to make clear the steps required to practice the claimed method. No new matter is believed to have been entered into claim 24 as a result of these changes. Applicant requests reconsideration and withdrawal of the rejection of claim 24 under 35 U.S.C. §101.

With regard to Items 4 and 5, Applicant traverses the Examiner's reliance upon the Moore reference, and requests reconsideration of amended claims 1 and 24, as well as dependent claims 3, 6-16, 23, and 24 for the following reasons. Applicant provides a condensate trap that includes a vortex chamber, an inlet, and a single outlet. The inlet is located so as to admit fluid into the chamber in a tangential direction with respect to the longitudinal axis of the chamber so as to promote a rotational flow of the fluid in the chamber about the longitudinal axis. In this way, a low pressure region is generated within the fluid. The outlet includes an escape aperture that is situated at an axial end of the chamber so as to open into the low pressure region in operation of the condensate trap. Applicant's condensate trap allows for flow control of steam and condensate by directing the flow into a chamber having a longitudinal axis, in a direction that is tangential with respect to the longitudinal axis of the chamber so as to promote a rotational flow of the fluid in the chamber about the longitudinal axis thereby to generate

a low pressure region within the fluid. The fluid is discharged from the chamber through an escape aperture that is situated at an axial end of the chamber and opens into the low pressure region. In this way, when condensate is at a temperature below the saturation temperature of the steam, the pressure in the low pressure region is discharged through the escape aperture, as liquid water, at a relatively high mass flow rate. As a consequence, condensate at a temperature higher than the saturation temperature flashes to steam within the low pressure region, and is discharged through the escape aperture as steam at a relatively low mass flow rate. The Moore reference fails to teach or suggest such an arrangement or process in anyway.

Anticipation under 35 U.S.C. §102 requires that each and every element of the invention defined in the claim be met in a single prior art reference. Those elements must either be inherent or disclosed expressly, and must be arranged as described in the claim. See, Diversitech Corporation v. Century Steps, Inc., 850 F. 2d 675, 7 U.S.P.Q. 2d 1315 (Fed. Circuit 1988), Constant v. Advanced Micro-Devices, Inc., 848 F. 2d 1560, 7 U.S.P.Q. 2d 1057 (Fed. Circuit 1988), and Richardson v. Suzuki Motor Company, 868 F. 2d 1226, 9 U.S.P.Q. 2d 913 (Fed. Circuit 1989). Nowhere within the four corners of the Moore reference is there disclosure or even a vague suggestion of a condensate trap including an inlet is located so as to admit fluid into the chamber in a condensate trap that includes a vortex chamber, an inlet, and a single outlet where the inlet is located so as to admit fluid into the chamber in a tangential direction with respect to the longitudinal axis of the chamber so as to promote a rotational flow of the fluid in the chamber about the longitudinal axis, as defined in amended independent claim 1.

Moreover, Moore utterly fails to disclose or suggest a process in which a condensate trap allows for flow control of steam and condensate by directing flow into a chamber in a direction that is tangential with respect to the longitudinal axis of the chamber so as to promote a rotational flow of the fluid in the chamber about the longitudinal axis thereby to generate a low pressure region within the fluid so that the fluid is discharged from the chamber through an escape aperture such that when condensate is at a temperature below the saturation temperature of the steam, the pressure in the low pressure region is discharged through the escape aperture, as liquid water, at a relatively high mass flow rate, while condensate at a temperature higher than the saturation temperature flashes to steam within the low pressure region, and is discharged through the escape aperture as steam at a relatively low mass flow rate, as defined in amended independent claim 24. Accordingly, it cannot be said that the Moore reference anticipates Applicant's invention.

These distinctions are quite important, for they reflect significant differences in construction, process, and functionality between Applicant's claimed invention and the teachings of Moore. Instead, Moore discloses a condensate removing device in which condensate and vapour enters at an inlet 14 and is discharged through piping 18, after passing through an orifice 16 and a discharge chamber 17. Moore attempts to achieve additional heating of the condensate by the vapour, particularly when condensate flow rates are low. A hot condensate will have a slower mass flow rate through the orifice 16, and consequently heating the condensate at low condensate flow rates will retard the discharge of the condensate so that some condensate always remains in the device, so

avoiding undesirable discharge of live steam. Heating of the Moore's condensate is achieved by means of a tubular member 33' which surrounds a screen 26 through which the vapour and condensate passes. The tubular member 33' thus retains condensate adjacent the screen 26, so that vapour emerging through the screen 26 is intimately mixed with the condensate in the tubular member 33' so achieving good heat exchange between the condensate and the vapour. As condensate accumulates within Moore's tubular member 33' it eventually overflows its top end, and passes through tangentially arranged passages 33 into a helical duct 29. On emerging from the helical duct 29, the heated condensate passes through the orifice 16.

Applicant respectfully traverses that Examiner's mischaracterization of Moore when stating: "*[T]he inlet being disposed to admit fluid into the chamber in a manner to promote a rotational flow of the fluid in the chamber about a longitudinal axis of the chamber.*" It is clear from Figure 3 of the Moore reference that the inlet pipe 15 enters the cover 11 in a radial direction. Furthermore, Moore's openings 22 are also radial, the result being that flow into the passage 21 is not such as to induce any rotational flow within that passage. Consequently, there is no suggestion that flow through the passage 21, into the screen 26, through the screen into the interior of the tubular member 33' or over the tubular member 33' into the chamber 31, has any rotational flow component whatsoever. It is likely that the flow regime will, instead, be a relatively random turbulent flow.

The Examiner has also mischaracterized Moore's helical passage 29 as a "*vortex chamber,*" so as to equate it with the "vortex chamber" of claim 1. However, a person of

skill in this art would immediately appreciate that the helical passage 29 cannot be regarded as a "chamber" as the expression is used in claim 1, and more specifically cannot be regarded as a "vortex chamber". Such a skilled person would understand a "vortex chamber" to be a chamber in which a vortex is generated. A vortex is a body of fluid rotating about its own axis. Consequently, the helical flow of fluid along the passage 29 cannot be regarded as a vortex, nor can the passage 29 itself be considered to be a vortex chamber. Furthermore, since the fluid flowing in the passage 29 is displaced away from the central axis about which the helical passage 29 extends, there can be no rotating fluid in the vicinity of that axis, so that no region of low pressure will be generated by the flow of fluid within the passage 29. Significantly, claim 24 defines condensate flashing to steam in the low pressure region of the chamber if the condensate is at a temperature higher than the saturation temperature at the pressure of the low pressure region. Such an effect is not disclosed by Moore.

Accordingly, Moore utterly fails to anticipate amended claims 1 or 24, in that Moore fails to disclose a vortex chamber, an inlet disposed to admit fluid into the chamber in a tangential direction, or a rotational flow which generates a low pressure region. It follows, necessarily, that Moore also fails to disclose or suggest in any way the escape aperture opening into the low pressure region, or having a diameter not greater than 30 or 40 millimeters, as defined by dependent claim 20 and 21, respectively.

With regard to Item 6, Applicant respectfully submits that the foregoing deficiencies in Moore are not remedied by the Examiner's reliance upon the Freimann

reference. In order for a prima facie case of obviousness to be established, there still must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2142 [emphasis added]. The Examiner has already admitted that Moore fails to disclose a vortex chamber that has a portion that is cylindrical. This is no doubt because Moore fails to teach or suggest any vortex chamber whatsoever. As explained hereinabove, the Examiner has mischaracterized Moore's helical passage 29 as a "*vortex chamber,*" so as to equate it with the "vortex chamber" of claim 1. A person of skill in this art would immediately appreciate that Moore's helical passage 29 cannot be a "chamber" as the expression is used in claim 1, and more particularly, cannot be regarded as a "vortex chamber". Those of ordinary skill would understand a "vortex chamber" to be a chamber in which a vortex is generated, i.e., a chamber in which a fluid rotates about its own axis. Moore's helical flow of fluid along passage 29 cannot be regarded as a vortex, nor can Moore's passage 29 itself be considered to be a vortex chamber.

Nowhere within the four corners of the Freimann reference is there disclosure, or even a vague suggestion of the structures defined by Applicant's claims 2, 4, and 5. More particularly, the Freimann reference discloses a device with diversion of a pipe flow under pressure with a vertically adjustable built-in part and a swirl chamber which tapers from the region of the tangential inlet to the axial outlet of the flow. Significantly, Freimann is concerned with "*circular tanks, sand classifiers, vortex separators,*

hydrocyclones or vortex cleaners, centrifugal forced separators, hydrocyclone separators as well as distributor structures for incoming water masses". A person of ordinary skill would interpret Freimann as relating to the treatment of liquid water in large quantities and at ambient temperatures and pressures. It would not be considered by the skilled person to provide any structures that would be relevant in the art of steam traps. The combination of Moore's condensate removing device in which condensate and vapour enters at an inlet 14 and is discharged through piping 18, after passing through an orifice 16 and a discharge chamber 17 with the structures taught by Freimann fail to teach or suggest all the claim limitations of independent claim 1 and dependent claims 2, 4, and 5.

In summary, Applicant submits that the unique apparatus defined by claims 1, 2, 4, and 5, as amended, is not disclosed in the prior art references relied upon by the Examiner, taken as a whole. In the absence of such, claims 1, 2, 4, and 5, as amended, define over the combined disclosure of the Moore and Freimann references.

With regard to Item 7, Applicant has considered the prior art references identified by the Examiner as pertinent and determined that none of them, taken alone, or in any valid combination with the Moore and/or Freimann references anticipates or renders obvious the present invention.

In view of the foregoing, Applicant respectfully submits that claims 1-15, 20-21, and 23-24 are in condition for allowance, as are currently withdrawn claims 16-19. Favorable reconsideration is therefore respectfully requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

If a telephone conference would be of assistance in advancing prosecution of the above-identified application, Applicant's undersigned Attorney invites the Examiner to telephone him at **215-979-1255**.

Respectfully Submitted,

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/Samuel W. Apicelli/
Samuel W. Apicelli
Registration No. 36,427
Customer No. 08933
DUANE MORRIS LLP
30 S. 17th Street
Philadelphia, PA 19103-4196
Tel: 215-979-1255
swapicelli@duanemorris.com